Staying Alive - *Battery Care Guide*

Like all rechargeable batteries, a notebook computer battery's ability to hold a maximum charge will decrease over time with use. Lithium-ion batteries used in notebook computers typically have a lifespan of 300 to 500 charge cycles. After a year of use or 300 charge cycles, a Lithium Ion battery holds only about 80 percent of its original capacity. But there are ways to extend a notebook battery's life, reducing the need to buy additional batteries, which in turn is good for the environment.

First, conserve battery power by reducing power consumption on your notebook. Hewlett-Packard recommends several steps, such as keeping the computer cool (between 18 and 25 degrees Celsius). You can also try adjusting screen brightness, removing peripherals and lowering processor speed.

Second, because high temperatures accelerate the deterioration of Lithium-ion cells, **keep the notebook away from prolonged exposure to heat** (for example, don't leave it in your car on a warm day). Also, remove the battery if the notebook is turned off and not plugged in to an AC adapter for more than two weeks – or if the notebook is plugged in to AC power continuously for more than two weeks.

Third, calibrate the battery. When users power up in fits and starts and then recharge without fully draining the battery, it reduces the amount of power available in a single charge cycle and can render the battery meter inaccurate.

There are four steps to calibrating a battery:

1. Disable power management in the Microsoft Windows operating system and select "always on" in the power scheme. That prevents the notebook from going to sleep.
2. Connect the AC adapter to the notebook and charge the battery until the meter says it's at 100 percent.
3. Remove the AC adapter and drain the battery until the notebook shuts off.
4. Reconnect the AC adapter, charge the battery and then turn Windows power management back on.

Last, Lenovo Master Inventor Howard Locker advises against leaving a notebook always plugged in. "The battery will last longer if it

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charges and discharges, so you don't want it 100 percent charged all the time," he explains. "Once in a while, let the battery drain."

Sleep or Hibernate?

Should you set your computer to power off, hibernate or sleep? *It depends.*

When setting up power settings, consider eliminating screen savers, which waste energy, says Lenovo Master Inventor Howard Locker.

Desktops typically use 60 to 80 watts during normal use and 10 watts when idle. Notebooks use 10 to 30 watts under normal use, and 6 watts while idle. In hibernation mode, computers use zero watts, while computers in sleep mode use about 0.2 watts.

There is a debate over which is most efficient. Going into and out of hibernation mode does consume considerable energy. And some argue that completely shutting down the computer hurts productivity because the boot-up time in the morning takes a few minutes.

Locker's recommendation: **Hibernate if you are gone for two are three days, but put it to sleep if you're only away overnight.**

COMPUSAVE COMPUTERS INC.

21 Stover St. N.
P.O. Box 224
Norwich, ON N0J 1P0
Phone: 519-863-6336
Fax: 519-456-1605
E-mail: support.cs@compusave.ca
Website: www.compusave.ca

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Battery Care Tips

I just Bought a New Battery, What Should I Do First?

New batteries are shipped in a discharged or low capacity condition. We generally recommend fully charging your battery. Refer to your user's manual for charging instructions.
Rechargeable batteries should be cycled (fully change and then fully discharge) 2 to 4 times initially to allow them to reach their full capacity. (**Note**: it is perfectly normal for a battery to become warm to the touch during charging and discharging).
New batteries are hard for your device to charge; they have never been fully charged and are therefore "unformed". Sometimes your device's charger will stop charging a new battery before it is fully charged. If this happens, simply remove the battery from your device and then re-insert it. The charge cycle should begin again. This may happen several times during your first battery charge. Don't worry; it's perfectly normal.

How Can I Maximize Battery Performance?

There are several steps you can take to insure that you get maximum performance from your battery:
Breaking In New Batteries - new batteries come in a discharged condition and must be fully charged before use. It is recommended that you fully charge and discharge your new battery two to four times to allow it to reach its maximum rated capacity.
Preventing the Memory Effect - Keep your battery healthy by fully charging and then fully discharging it at least once every two to three weeks. Exceptions to the rule are Li-Ion batteries which do not suffer from the memory effect.
Keep Your Batteries Clean - It's a good idea to clean dirty battery contacts with a cotton swab and alcohol. This helps maintain a good connection between the battery and your portable device.
Exercise Your Battery - Do not leave your battery dormant for long periods of time. We recommend using the battery at least once every two to three weeks. If a battery has not been used for a long period of time, perform the new battery break in procedure described above.
Battery Storage - If you don't plan on using the battery for a month or more, we recommend storing it in a clean, dry, cool place away from heat and metal objects. NiCad, NiMH and Li-Ion batteries will self-discharge during storage; remember to break them in before use. Sealed Lead Acid (SLA) batteries must be kept at full charge during storage. This is usually achieved by using special trickle chargers. If you do not have a trickle charger, do not attempt to store SLA batteries for more than three months.
For Notebook Users - To get maximum performance from your battery, fully optimize the notebook's power management features prior to use. Power management is a trade off: better power conservation in exchange for lesser computer performance. The power management system conserves battery power by setting the processor to run at a slower speed, dimming the screen, spinning down the hard drive when it's not in use and causing the machine to go into sleep mode when inactive. Your notebook user's guide will provide information relating to specific power management features.

How Should I Use and Care for my Rechargeable Battery?

It is important to condition (fully discharge and then fully charge) the battery every two to three weeks. Failure to do so may significantly shorten the life of the battery. To discharge, simply run the battery's power until it shuts down or until you get a low battery warning. Then recharge the battery as instructed in your user's manual.
If the battery will not be in use for a month or longer, it is recommended that you fully charge the battery, remove it from the device and store it in a cool, dry, and clean place.
It is normal for a battery to become warm during charging and discharging.
A charged battery will eventually lose its charge if unused. It may therefore be necessary to recharge the battery after a storage period.
The milliampere-hour(mAh) rating of the DrBattery.com battery will often be higher than the one on your original battery. A higher mAh rating is indicative of a longer lasting (higher capacity) battery and will not cause any incompatibility issues. A DrBattery.com battery will, in most cases, outperform the original by 30% to 50%. Actual battery run-time depends upon the power demands made by the equipment. In the case of notebook computers, the use of the monitor, the hard drive and other peripherals results in an additional drain upon the battery, effectively is reducing the battery's run-time. The total run-time of the battery is also heavily dependent upon the design of the equipment. To ensure maximum performance of the battery, optimize your computer's power management features. Refer to your computer manual for further instructions.
Do not short-circuit. A short-circuit may cause severe damage to the battery.
Do not drop, hit or otherwise abuse the battery as this may result in the exposure of the cell contents, which are corrosive.
Do not expose the battery to moisture or rain.
Keep battery away from fire or other sources of extreme heat. Do not incinerate. Exposure of battery to extreme heat may result in an explosion.

My charger shows that my battery is fully charged, but it is not working... Why?

This is known as "False Peak" and is a very common condition during first time battery use (or using a battery that has been discharged for several months). The charger light may go out after only five to ten minutes, indicating that it is fully charged when it is not. Should this happen, simply leave the battery on the charger for about an hour, remove it, then return it to the charger immediately. The battery will resume normal charging and the charger light will indicate when the battery is ready for use.

What is the "Memory Effect"?

NiCad batteries, and to a lesser extent NiMH batteries, suffer from what's called the "Memory Effect". What this means is that if a battery is continually only partially discharged before re-charging, the battery "forgets" that it has the capacity to further discharge all the way down. To illustrate: If you, on a regular basis, fully charge your battery and then use only 50% of its capacity before the next recharge, eventually the battery will become unaware of its extra 50% capacity which has remained unused. Your battery will remain functional, but only at 50% of its original capacity. The way to avoid the dreaded "memory effect" is to fully cycle (fully charge and then fully discharge) your battery at least once every two to three weeks. Batteries can be discharged by unplugging the device's AC adaptor and letting the device run on the battery until it ceases to function. This will insure your battery remains healthy.

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